# Dreams, realism and critics of stakeholders on implementing and adopting mobile Seamless Learning Scenario's in Dutch Secondary education

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**Ellen Rusman**
Welten Institute, Open University of the Netherlands
Valkenburgerweg 177, 6419 AT Heerlen
Ellen.Rusman@ou.nl

**Esther Tan**
Welten Institute, Open University of the Netherlands
Valkenburgerweg 177, 6419 AT Heerlen
Esther.Tan@ou.nl

**Olga Firssova**
Welten Institute, Open University of the Netherlands
Valkenburgerweg 177, 6419 AT Heerlen
Olga.Firssova@ou.nl

**ABSTRACT**
In order to move the adoption of mobile Seamless learning to a broader and more sustainable level in secondary education, it is important to gain insight into perspectives of various stakeholders (e.g. managers, teachers) that influence acceptance and adoption processes. Apparently, stakeholders perceive specific benefits as well as barriers in adopting seamless learning scenario's in their daily educational practices, as Pegrum et al. (2013) concluded after studying adoption in Australian primary schools. We wanted to see whether these perceived benefits and barriers were comparable for Dutch secondary schools. Therefore, we organized a workshop with various stakeholders (teachers, school management, policy makers) in Dutch secondary education to obtain insight in the factors they considered important in order to adopt seamless learning scenarios on a broader and lasting scale. In the workshop we used the Disney-model for brainstorming, reacting to a statement as either a 'Dreamer', 'Realist' or 'Critic', to gain a broader insight in the problem domain. The workshop was organised in two rounds with 26 participants in total. Associations were written on post-its and analysed bottom-up, thus resulting in factors affecting adoption of seamless learning scenario's in daily educational practice. Results provide insight in how a broad group of stakeholders perceives both the benefits, realistic arrangements as well as the barriers to broad and sustainable adoption of mobile seamless learning in Dutch secondary schools.

**Author Keywords**
Seamless learning; mobile learning; sustainability; implementation; school organisation; adoption

## INTRODUCTION

Looking at the adoption and implementation of mobile seamless learning in education, it is striking that especially higher and primary education are adopters (Wu et al. 2012) and that secondary education is lacking behind. In order to move the field of 'Seamless learning' to a more sustainable level of adoption (Milrad et al., 2013), it is important to gain insight into perspectives of various stakeholders that play a role in the adoption and implementation in secondary education. 'Seamless learning' is about connecting (learning) experiences and learning activities that learners experience in various environments and settings through technology-supported learning scenario's using wireless/handheld devices, thus supporting, improving and enhancing learning processes (Wong & Looi, 2011). The purpose is that learners experience a continuity of learning across environments and settings (natural versus designed combinations of locations, technologies and social practices) at different times (adapted from Sharples et al., 2012, p.24). Seamless learning designs can foster applicable knowledge, awareness of different perspectives of the world, behavioural changes of individuals and groups, support personal growth and sustainable motivation of a person, enhance social learning and involvement of third parties in learning processes (e.g. parents, experts, stakeholders, alumni) and support learning complex skills.

These objectives are also important for secondary education nowadays, however apparently stakeholders perceive specific barriers in adopting seamless learning in their daily educational practices. Pegrum et al. (2013) performed a study into these barriers within Australian primary schools, however started with a broader literature review across primary, secondary and tertiary levels, followed by semi-structured interviews with various stakeholders ((vice) principals, teachers and technology co-ordinators) in primary education which were (Pegrum et al, 2013, p.71) "*able to offer an overview of technology use at all schooling levels, from early childhood and primary through to middle and upper school"*. Based on their study they mention several benefits of mobile handheld technologies (digital media players, smartphones, personal digital assistants and tablets) as well as highlight several barriers. Benefits mentioned are that "*these devices lead to an **expansion of the spaces and times of learning**, with student learning **outside the places of formal education** and the hours of formal timetables*" (p.67). Learners come to understand "*how to utilise everyday life-worlds as learning spaces*" (Pachler et al. (2010) in Pegrum et al, 2013, p.68) and engage in situated contextualised learning instead of only profiting from increased mobility and independency. Pegrum et al. (2013) mention that mobile technologies are particularly suited for active, collaborative, student-centered approaches, although they can support a range of other pedagogical approaches (e.g. behaviourist). Mobile devices are both suited as consumption as well as production devices, also offering possibilities to be more creative as well as sharing and publishing their work. They also offer functionality for students with special needs, such as visual impairments or dyslexia. First research outcomes reported in the article confirm the potential of m-learning

to improve motivation, engagement and learning outcomes. Barriers mentioned in Pegrum et al. (2013) are that technology may be overemphasized at the expense of pedagogy and content. In order to decrease this tendency, attention should be paid to hardware (e.g. small screen size) and software issues (e.g. sync apps across multiple devices), network speed and capacity ('slow' internet) as well as security as well as technical support. In addition, concerns around equity and access (related to the 'digital divide') as well as ethical issues (digital safety, privacy and surveillance) and the blurring of public/private boundaries were expressed. Being a teacher in networked learning contexts lead to new ways to guide, capture and document learning and assess learners. This requires teacher training and professionalization facilities. Uosaki et al. (2013) also mention several keys to successful implementation of mobile learning: (1) Management and facilities; (2) Instructors' abilities; (3) Flexibility of curriculum and class setup and (4) Learners' motivation, which largely overlaps with the findings of Pegrum et al. (2013). We wanted to see whether the perceived benefits and barriers and other factors affecting adoption of Seamless Learning were comparable for Dutch secondary schools. Therefore, we organized a workshop with various stakeholders (teachers, school management, policy makers) in Dutch secondary education to obtain insight in the factors they considered important in order to adopt seamless learning on a broader scale. In the following sections, we subsequently describe the set-up of the workshop, the methodology and results that we obtained, and compare them to the results from the Australian study. Finally, we draw conclusions on factors affecting adoption of mobile Seamless learning in Dutch secondary education and in education more generally.

## THE SET-UP OF THE WORKSHOP

The workshop was organised with two different groups in two rounds. Each round lasted 1 hour. The workshop started with welcoming and introducing the participants shortly to the programme, the upcoming activities and the topic 'Seamless learning', including its most important concepts and definitions. Then we introduced participants to the Disney-brainstorming technique (Dilts, 1995; McGuiness, 2009; Elmansy, 2015). Walt Disney had the ability to explore and to look at something from different perspectives and then benefit from the synergy of these perspectives. This thinking process is mirrored and precipitated in the Disney-brainstorming technique, in which (mostly) three roles are distinguished: 1) the dreamer, 2) the realist and 3) the critic. Shortly, dreamers share their dream without restrictions or criticism, which helps to create ideas; realists reason and plan in a logical way to achieve an objective, which helps to turn imaginary ideas into a manageable action plan; critics looks at whatever can go wrong in a scenario, thus discovers barriers and thinks constructively of ways to solve these problems. In this workshop, we also added the role of an observer, who had to keep track of all thoughts, ideas and arguments and summarize and present them to the other groups.

Subsequently, participants were asked to fill a short questionnaire (Appendix 1) with some questions about their background, role and their educational experience in secondary schools. Filling this questionnaire was voluntary. Participants were then organised in groups of minimum 4, depending on where they naturally took their seat, and were each assigned to one specific role of the Disney Brainstorming technique. Thus, sometimes roles 'doubled' within each group, depending on the group size, however within each group all four roles were always represented. They received a role description of their role, some questions specifically related to the role they were given and coloured post-its, a specific colour for each role, to describe their thoughts. To give an impression, we here include an exemplary role description:

> '*Dreamer*'- *Imagine that ….*
>
> *A dreamer approaches the statement from a positive stance, which doesn't have to be realistic. In this role you can reach for the stars. Don't let reality, problems and risks hinder your thoughts and think from an enthusiastic stance about this idea. What would you do if failure is impossible?*
>
> *Questions that you could ask yourself are: What would you like to do? How does this looks like? Visualize the situation as if you already reached your objectives. Continue until this image meets all your wishes: How does this look like, what do you feel and what are your thoughts? Why would we like to do this? What are the advantages? What is the added value if we could realize this?*

Each participant replied individually from their 'role' perspective to the following statement and noted their thoughts on post-its:

**"*Seamless learning experiences should become a standard component within the [Dutch] secondary educational programme*".**

Then the results were shared within the group by sticking them on a poster and explaining them to the other group members. Furthermore, the summarized results of each group was presented by the observer and discussed within the overall group. All questionnaires, post-its and posters were collected after the workshop.

## METHODOLOGY

All questionnaires were analysed to extract background characteristics about the workshop participants and all post-its were transcribed in one overview document, divided in three columns (dreamer/criticus/realist). Statements that were not readable were left out of the analysis. Statements were first analysed per column, to see whether they differed in terms of content per 'role perspective'. However, looking at the statements, they all referred to factors affecting adoption/acceptance

of SL in secondary education, and the load (positive, negative, neutral stance) didn't differ for the content of the expressions. Each explanation was considered as a coding unit (Miles, Huberman & Saldana, 2013). In this way a coding scheme (Neuendorf, 2002) was derived from the statements in an inductive process drawn from a grounded theory approach (Corbin & Strauss, 2008). This coding scheme (Appendix 2) was then applied by a researcher, in order to analyse and structure the statements as well as (slightly) adapt the coding scheme. Only a single code per statements was allowed. When a statement could be coded with more than 1 code, the most applicable code was selected. Part of the statements (22 = 11%) were coded by a second researcher. The interrater reliability of this coding was determined by calculating Fleiss' et al. (2003) Kappa using a digital (partly online) calculator provided by Graphpad (2018). The interrater-reliability (Fleisch et al. 2003 Kappa) measure of agreement between the two raters was Kappa= 0.94, SE= 0.05 and 95% confidence interval, from 0.84 to 1.000. According to Fleiss et al (2003), this can be considered a very good (> 0.75) interrater-reliability. The remaining responses were analyzed by one rater only. Based on this coding, an overview of factors affecting adoption/acceptance of SL that were mentioned most (expressed in frequencies and percentages of the total number of statements) by stakeholders in secondary schools was constructed. As a minimal number of statements a 5% (of total number of statements) was used.

## RESULTS

In total 26 participants joined the workshop, of which 4 didn't fill the questionnaire, but contributed with post-its to the content of the workshop. 15 participants joined the first and 11 the second session. The 22 participants that filled the questionnaire can be characterised as follows:

| **Age** | **Total number** | **Percentages** |
|---|---|---|
| 30-39 | 2 | 9% |
| 40-49 | 8 | 36% |
| 50-59 | 7 | 32% |
| 60-69 | 5 | 23% |
| **Profession/role(*)** | | |
| Teacher (2nd-ary education) | 10 | 40% |
| Educational advisor/trainer in 2nd-ary education | 5 | 20% |
| Educational manager/leader in 2nd-ary education | 4 | 16% |
| Teacher/educator (otherwise) | 2 | 8% |
| Parent | 2 | 8% |
| Educational policy maker in 2nd-ary education | 1 | 4% |
| Educational superintendent/ inspectorate of 2nd-ary education | 1 | 4% |

**Table 1: Overview of some background characteristics of workshop participants (in %, rounded-off)**

(*) = some people indicated they had various roles, therefore the percentage is determined on the total number of roles (25) counted

There was an equal division of gender (50% male/50% female) in the workshop. There were no participants aged between 20-29 and above 70 years. 68% of the workshop participants were between 40 and 60 years (see Table 1). The majority (76%) of the participants fulfilled either a role as teacher, educational advisor/trainer or manager in secondary education. The average number of experience in (mainly secondary) education (without the parents and 1 person who just started on a new position) was 19 years, indicating that our participants are highly experienced in education. Looking at the adjectives that were used to characterise their educational organisations, participants used the following words more than 5 times ( ≥20%) within the group: innovative (41%), social/people-oriented (36%) and result-oriented. As the workshop was organised within the context of an event around the jubilee of an innovative school, it is likely that the workshop participants are not part of an 'average' type of Dutch secondary school and are interested or engaged in innovations. Part of the innovation in this school is parental involvement, which is mirrored in the participation of parents in this workshop.

The participants generated in total 192 readable statements, on average a bit over 7 statements per participant. Participants mentioned considerations and factors affecting adoption and acceptance of SL related to three broad categories and at different levels (micro, meso, macro), as represented in Table 2.

| **Category** | **Frequency of statements** | **Percentage of statements (of total)** |
|---|---|---|
| Considerations and factors affecting **decision processes** at organizational level towards implementing Seamless learning designs | 77 | 40 % |

| | | |
|---|---|---|
| Organization of **change process** in educational organization: from current learning designs towards implemented Seamless learning designs | 44 | 23 % |
| Organization of **design and implementation process** of Seamless learning in educational practice | 71 | 37 % |
| **Total** | 192 | 100% |

**Table 2: Categories of statements mentioned as affecting implementation of Seamless learning in 2n-ary schools**

Each category was composed of a number of factors. Factors that were mentioned more than 5% of the total number of statements (≥ 10 statements) are represented in Table 3 and per factor some representative example statements are given.

| Category/factor | Freq. | % | Description | Example statements |
|---|---|---|---|---|
| Considerations and factors affecting **decision processes** at organizational level | | | | |
| **Benefits**/surplus value/results | 29 | 15% | Expected/envisioned/perceived/ proven surplus value of implementing Seamless Learning | ∗ A learner should be enabled to learn 24/7 days per week and engage in their personal development (and that of their talents) and be supported during this process by professionals<br>∗ Intrinsic motivation<br>∗ Not being positioned in a 'square' (e.g. VMBO, HAVO, VWO)<br>∗ Learner owns own learning process<br>∗ Anytime, anywhere learning => positive<br>∗ Making learning trajectories individual. Increasing pace is possible. Go to the next level<br>∗ Experience of success: learners work with more fun, facilitating dialog, applicable knowledge, increases curiosity<br>∗ Connecting theory and practice<br>∗ We can get 'loose' from conventions, subjects and test/exam weeks etc.<br>∗ Advantages: inexhaustible opportunities; matching to individual levels, interests, qualities; various roles<br>∗ Seamless merges with what most learners find attractive in ICT |
| **Costs**/efforts/ investments/ dangers | 14 | 7% | Expected /envisioned/perceived/proven costs or risks of implementing Seamless Learning | ∗ How do you prevent simplification of learning content and learning experiences?<br>∗ Too much personal development oriented, too individual. Too much focus on yourself?<br>∗ How much (time) does it cost?<br>∗ How will the (gained) insights applied to other situations? (transfer)<br>∗ Do you have to change the complete curriculum for this? |
| **Technology** | 12 | 6% | Issues related to effects on, accessibility to, development of and functioning of technology for teachers and learners | ∗ Is a 'good talk' still taking place or is attention mainly going to technology?<br>∗ Developing technology is time-intensive. Who is going to do this? Will it be adaptable/flexible?<br>∗ If technology isn't working as it should, are you not becoming too dependent on it?<br>∗ Will learners, with repetitive use, not be bored by a digital app, so that they won't work seriously with it anymore?<br>∗ Does everybody has access to this technology?<br>∗ Youth already use to much media at school, shouldn't they be offline for a while? |
| **Organization of change process (CP) in educational organization** | | | | |
| **Organizational management and planning** | 15 | 8% | Practical management and organizational measures (e.g. planning, finances, technology, working groups, implementation approach) that need to be | ∗ We need all educational teams/coaches to support these processes<br>∗ How do you motivate everybody?<br>∗ Financial plan<br>∗ Keep it on the agenda<br>∗ Availability of technological support |

| | | | | |
|---|---|---|---|---|
| | | | considered, planned, taken and monitored in order to manage the change process of implementing SL | * Time planning needed to gain insight from development to implementation<br>* What are preconditions/what do we (still) need?<br>* How do we 'sell' to parents that we start with seamless learning? |
| **Organization of <u>design and implementation process</u>** | | | | |
| Experiential design of activities within school and in out-of-school environments/settings | 13 | 7% | Organization of activities in various environments, settings and social practices that facilitate learners to use all their senses and see the effect of their actions in the real-world | * Children learn with all their senses and learning should therefore also address all senses<br>* You learn with your brains, but also with your stomach, hands, feeds etc.<br>* Availability of feasible environments/settings as contexts<br>* Is this also do-able when a school is not located in a (bigger) city?<br>* Learning is doing, so everything we do helps us to learn. Learning doesn't know boundaries. Connecting learning inside school with learning outside school. |
| Process-oriented design of interdisciplinary/transboundary activities | 12 | 6% | Considerations and design measures that come with looking at a learning process as a continuous individual 'meaning-making' process in contexts, that is supported across various environments, settings and social practices | * How can be fade away the boundaries between 'in' and 'outside' school?<br>* Process more important that product<br>* Connecting learning at school and learning at home<br>* We look how participants behave (uptake of roles, participation, creativity, but also from domains) and use assessment criteria and a methodology to assess the performance of participants and measure, adapt and improve the design of the learning task<br>* How do we monitor these (learning)experiences and learning activities?<br>* We plan together with learners and reach consensus naturally<br>* Things may go wrong/faults can be made |
| Guidance/ support/ degree of autonomy of learners | 12 | 6% | Considerations on needed help, guidance and support, the locus of control of this support for stakeholders (e.g. teachers, learners, coaches, experts) and manners to organize support | * Who is helping a learner with connecting experiences to their own learning process?<br>* Who determines the context? Who determines the critical incidents?<br>* Coaching (and control) by a teacher at "a distance"<br>* Good digital approach for learner-regulated parts<br>* Leaners can experience 'too much' freedom if they are not used to this. Provide fixed rules (behavior expectancies). Technology needs to work.<br>* Learners need structure. At the end: taking exams. Now we have a set, planned route towards these exams. |
| (Learning) Objectives and (learning) results | 10 | 5% | Various kind of (learning) objectives and results that are seen as a specific advantage of SL and expected to be realized by implementing SL | * Knowledge? Insight?<br>* Naturally motivated learners<br>* More self-reflection<br>* Learner owns own learning process<br>* Integration of subjects and skills |
| Social learning, participation and involvement of network/various social practices | 10 | 5% | Considerations on and development of partnerships between organizations and involvement of various types of 'out-of-school' individual stakeholders (e.g. parents, professionals, experts) to support social learning practices | * Assignments/tasks in teams, also out-of-school<br>* Invite parents, professionals/experts/craftsman for supporting specific subjects/topics into the school<br>* Participation (network): learners, teachers, companies (ICT), parents<br>* Extra time for schooling and excursions to other schools<br>* Parents are busy! |

## CONCLUSIONS AND DISCUSSION

This study contributes to the domain of mobile seamless learning by investigating adoption and acceptance issues amongst stakeholders (teachers, managers, teacher trainers, parents) in Dutch secondary education and comparing their perspectives with their Australian colleagues. Results show that benefits and barriers perceived by our Dutch stakeholders in secondary schools largely overlap with the factors influencing acceptance and adoption mentioned by their colleagues in Australian

schools However, some specific adoption and acceptance issues of mobile seamless technology mentioned in this study were not yet mentioned in the studies of Pegrum et al. (2013) as well as Uosaki et al. (2013). On the main level, a process view perspective for the design and support of seamless learning processes across context is important. Additionally, concerns that education becomes too much personal development oriented and too individual; that transfer of learner experiences gained in one situation is not made to another and of simplification of learning content and experiences. Also, additional practical issues with realising involvement of a larger network and social practices and in supporting experiential learning, such as safety and insurances, limitation of available time of parents, and the availability of feasible environments/settings as contexts were raised. Amongst benefits were the prevention of prejudices (not being placed in a 'square' based on school type) and the fit to what the target group finds attractive in ICT usage and their world perspective. It also worked the other way around, as Australian colleagues e.g. specifically mentioned affordances offered for people with special needs.

As Pegrum et al. (2013) already stated, there is yet little published research on the affordances of mobile handheld technologies used in educational practice, their observed benefits, faced challenges and initial solutions during implementation and whether they are subsequently meeting expectations. This study contributes to this understanding, however has some limitations as well. As both previous studies don't provide insight in the 'weight' of the different factors mentioned, we can't compare whether or not the same issues are perceived broadly and frequently amongst stakeholders. It would therefore be worthwhile to look at another perspective to our complete set of data without using the filtering criterium of 5%, in order to see whether a more detailed subdivision of statements, within our coding scheme, would be worthwile. Another limitation shared between our studies is that the identified factors that will influence acceptance and adoption of mobile seamless learning are *perceptions of stakeholders* and are explored on a relatively small scale (26 participants) and a convenience sample. It is what they *think* would affect adoption and acceptance, however how this really would work is something else. Nevertheless, we know that perceptions and mind-sets of stakeholders effect the adoption of innovations in general, so it is a first step in developing and testing an adoption and implementation model. To conclude, future, large-scale studies into the perceptions of stakeholders may practically benefit from and elaborate upon the coding scheme developed in this study.

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**APPENDIX 1 – SHORT QUESTIONNAIRE WORKSHOP 'SEAMLESS LEARNING'**

**Participation to this questionnaire is voluntary. By filling this questionnaire you consent to using the data for research purposes.**

1. What is your gender? ☐ male ☐ female
2. What is your age?

| | |
|---|---|
| ☐ 20-29 | ☐ 50-59 |
| ☐ 30-39 | ☐ 60-69 |
| ☐ 40-49 | ☐ 70-79 |

otherwise, namely: …… years

3. What is your function/profession?

| | |
|---|---|
| ☐ Teacher secondary education | ☐ Educational advisor |
| ☐ Teacher in other educational context | ☐ Policy maker in education |
| ☐ Educational researcher | ☐ Manager in education |

otherwise, namely: ……..

4. How many years of experience do you have in this function/profession? …… years

5. If you are a teacher in secondary education, which domain, level, target group are you teaching? Give a short description (e.g. 'live sciences, gymnasium, lower classes).
……
……..……

6. Could you characterise your educational organisation by three adjectives?
(e.g. conservative, innovative, technological, inspiring, professional, result-oriented, bureaucratic, slow etc.).
……
……
……

**Thanks for your collaboration!**

**APPENDIX 2– CODING SCHEME FACTORS AFFECTING ADOPTION AND ACCEPTANCE OF SL**

**Considerations and factors affecting decision process (DP) towards implementing Seamless learning (SL) designs**

| Element/factor | Code | Description |
|---|---|---|
| Costs/efforts/investments/dangers | DP-cost | Expected /envisioned/perceived/proven costs or risks of implementing Seamless Learning |
| Benefits/surplus value/results | DP-benefit | Expected/envisioned/perceived/proven surplus value of implementing Seamless Learning |
| Technology | DP-technology | Issues related to effects on, accessibility to, development of and functioning of technology for teachers and learners |
| Teachers competences and attitudes | DP-teacher | Characteristics of teachers in terms of their fit in terms of competences and attitudes to deal with a Seamless Learning model |
| Target group 'fit'/suitability, competences and attitudes | DP-learner | Characteristics of various possible target groups of learners (e.g. at different educational levels, with different personal characteristics) and whether or not a Seamless learning model fits/suits to their needs and daily life |
| Social expectancies and role/ requirements of organization | DP-society | Role, requirements, preparation and enculturation processes that are expected from schools by society (e.g. preparing for a job/working life, succeeding in exams etc.) |
| National (educational/curriculum/assessment) programmes and requirements | DP-nation | Relation of SL to the national curriculum and examination program requirements, inspection and recognition of acquired competences (applicable knowledge, skills & attitudes in contexts) at a national recognized level |

**Organization of change process (CP) in educational organization towards implementing Seamless learning designs**

| Element/factor | Code | Description |
|---|---|---|
| Teacher professionalization | CP-prof | Needs analysis and organisation of professionalization activities for teachers (e.g. learning on the job, training and educational programmes/activities) necessary to work in practice with SL models |
| Organizational management and planning | CP- manage | Practical management and organizational measures (e.g. planning, finances, technology, working groups, implementation approach) that need to be considered, planned, taken and monitored in order to manage the change process of implementing SL |
| Evaluation and quality control | CP- control | Piloting and evaluating activities to ensure quality and determine whether envisioned objectives are indeed reached in practice. |
| Changing roles and responsibilities | CP-roles | Effects and subsequent changes of implementing SL in education on individual roles, responsibilities and tasks of stakeholders and organizational units (e.g. sections, domains) |
| Change of daily school organization | CP-organize | Practical effects on daily school organization, e.g. on time schedules, sections/units etc. |
| Change of models, methods and approaches | CP- models | Guidelines, considerations (how/when) and changes coming with using SL as a learning model and method, in combination with existing other methods |

**Organization of design and implementation process (D&I) of Seamless learning designs (learning in and across environments/settings) in educational practice**

| Element/factor | Code | Description |
|---|---|---|
| Technology | D&I - technology | Technological prerequisites, design considerations (e.g. needed functions) and arrangements (e.g. hard-and software, network) that need to be made in order to implement SL in practice |
| Guidance/support/ degree of autonomy of learners | D&I - support | Considerations on needed help, guidance and support, the locus of control of this support for stakeholders (e.g. teachers, learners, coaches, experts) and manners to organize support |
| Social learning, participation and involvement of network/various social practices | D&I - social | Considerations on and development of partnerships between organizations and involvement of various types of 'out-of-school' individual stakeholders (e.g. parents, professionals, experts) to support social learning practices |
| (Learning) Objectives and (learning) results | D&I - objectives | Various kind of (learning) objectives and results that are seen as a specific advantage of SL and expected to be realized by implementing SL |
| Assessment (formative & summative), evaluation and testing | D&I - assess | Considerations on and development of different types of assessment methodologies, methods and instrument needed to evaluate and provide feedback on acquisition of competences and personal insights |
| Process-oriented design of interdisciplinary/transboundary activities | D&I - process | Considerations and design measures that come with looking at a learning process as a continuous individual 'meaning-making' process in contexts, that is supported across various environments, settings and social practices |
| Experiential design of activities within school and in out-of-school environments/settings | D&I - experience | Organization of activities in various environments, setttings and social practices that facilitate learners to use all their senses and see the effect of their actions in the real-world |
| Safety-measures/ insurance | D&I- safety | Considerations related to ensuring safety of involved stakeholders (learners, teachers, ..) in various environments and settings |